

MAGNETIZING STRUCTURE OF MOTOR

FIELD OF THE INVENTION

The present invention relates to a magnetizing structure of a motor,
5 and more particularly to a structure for magnetizing a rotor magnet or a
stator magnet of a direct current motor.

BACKGROUND OF THE INVENTION

A traditional direct current motor essentially comprises two major
components: a rotor and a stator, one of which is made of permanent
10 magnet and the other is an electric magnet, and the one is disposed
circumferentially by the other. Between a rotor and a stator, there exists
an air gap. In one case, an inner rotor rotates within a stator; in another
case, an outer rotor rotates around an inner stator. A permanent magnet
incorporated on either a rotor or a stator directs a magnetic field into the
15 air gap, which interacts with another magnetic field of changing polarity
to develop the torque for driving a motor.

Fig. 1 shows a magnetizing structure that is commonly found in a
motor. Such structure of an outer-rotor type motor includes a rotor 12
having a magnet cylinder 121 with smooth surfaces on both sides and a
20 stator 11 having a plurality of silicon steel sheets 111 wound by a
plurality of winding coils 13. When a current is applied to a winding
coil, an electric magnetic field is created to repulse the magnetic field
caused from the permanent magnet, thereby the rotor rotates and drives
an article such as a fan.

25 The permanent magnet is usually in a shape of cylinder; therefore,
the term "magnet cylinder" hereinafter means a cylindrical-shaped
magnet, unless otherwise specified.

drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a sectional view showing a magnetizing structure of motor according to prior art;

- 5 Fig. 2 is a sectional view showing a structure for magnetizing of a rotor having a magnet cylinder with an inner wavy curve according to the first preferred embodiment of the present invention;

Fig. 3 is a sectional view showing a structure for magnetizing a rotor having a magnet cylinder with an outer wavy curve according to the first preferred embodiment of the present invention;

Fig. 4 is a sectional view showing a structure for magnetizing a stator having a magnet cylinder with an outer wavy curve according to the second preferred embodiment of the present invention; and

Fig. 5 is a perspective view showing a structure for magnetizing a rotor having a magnet cylinder with a lumpy edge according to the third preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Fig. 2, the first preferred embodiment of the present invention provides a structure for magnetizing a rotor magnet, which includes a rotor having a magnet cylinder 22 with an inner wavy curve surface 25 and a stator 21 having a plurality of silicon steel sheets 24 wound by a plurality of winding coils 23. The silicon steel sheets 24 are symmetrical, which facilitates mass production to reduce cost. Since the magnet cylinder 22 is manufactured by a molding and sintering process, the shape or size of it can be predetermined and the cost is not high. Owing to the inner wavy curve surface 25, the magnet cylinder 22 directs a magnetic field into the air gap for interacting with the

inductive magnetic field easily to develop the torque and radiate the internally generated heat.

The structure for magnetizing a rotor magnet shown in Fig. 3 is the same as that in Fig. 2, except that a rotor having a magnet cylinder 22
5 with an outer wavy curve surface 39.

Referring to Fig. 4, the second preferred embodiment of the present invention provides a structure for magnetizing a stator magnet, which includes a stator having a magnet cylinder 40 with an outer wavy curve surface 45 and a stator 41 having a plurality of silicon steel sheets 42
10 wound by a plurality of winding coils 43. Certainly, the outer wavy curve surface can be replaced with an inner wavy curve surface.

Referring to Fig. 5, the third preferred embodiment of the present invention provides a structure for magnetizing a rotor magnet. The structure in Fig. 5 is the same as that in Fig. 2, except that the rotor has a
15 magnet cylinder with a lumpy edge which is a combination of a plurality of concave surface 52 and a plurality of convex surfaces 51. Certainly, a structure for magnetizing a stator magnet is also suitable, wherein the stator has a magnet cylinder with a lumpy edge which is a combination of a plurality of concave surfaces and a plurality of convex surfaces.

20 As will be apparent from the above description according to the present invention, the improved magnetized structure for magnetizing a rotor magnet or a stator magnet of a direct current motor is suitable to start a motor easily, radiate the internally generated heat quickly and prevent the locked rotor condition.

25 While the invention has been described in terms of what are presently considered to be the most practical and preferred embodiments, it is to be understood that the invention needs not be limited to the

disclosed embodiment. On the contrary, it is intended to cover various modifications and similar arrangements included within the spirit and scope of the appended claims which are to be accorded with the broadest interpretation so as to encompass all such modifications and similar structure.